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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER
JACOBSON, MICHELE LYNN

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patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/588,487
Filing Date: August 04, 2006
Appellant(s): SCHMITZ ET AL.

Harris A. Pitlick
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 3/29/10 appealing from the Office action mailed 10/23/09.

(1) Real Party in Interest

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application: 1-20.

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being

maintained by the examiner except for the grounds of rejection (if any) listed under the subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

WITHDRAWN REJECTIONS

The following grounds of rejection are not presented for review on appeal because they have been withdrawn by the examiner. The rejection of claims 1-20 under 35 U.S.C. 112, second paragraph are withdrawn in light of the amendment after the final rejection submitted 1/22/10.

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

(8) Evidence Relied Upon

U.S. Patent Application Publication 2002/0142118	Schmitz et al.	10-2002
USPN 6,355,358	Boer et al.	3-2002
USPN 6,428,866	Jadamus et al.	8-2002

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmitz et al. U.S. Patent Application Publication No. 2002/0142118 (hereafter referred to as Schmitz) and Boer et al. U.S. Patent No. 6,355,358 (hereafter referred to as Boer) and Jadamus et al. U.S. Patent No. 6,428,866 (hereafter referred to as Jadamus).

3. Schmitz teaches a composite having two or more layers, which includes an EVOH barrier layer. (Para. 11) The ethylene content in the EVOH copolymer is recited to be between 25 to 60 mol%. (Para. 120) When composites having two or more layers are developed, for example, for use as a tube for carrying liquid or gaseous media in motor vehicles, the molding compositions must have sufficient chemical resistance to the media to be carried, and the tubes must meet all the mechanical requirements placed upon them, even after long exposure to fuels, oils or heat. In addition to meeting the requirement for adequate fuel resistance, the automotive industry demands

improved barrier action from fuel piping, in order to reduce emissions of hydrocarbons within the environment. This has led to the development of tube systems having two or more layers, for example using EVOH as barrier layer material. However, EVOH is incompatible with PA11, PA12, PA612, PA1012 and PA1212, which can be used for the outer layer since they have good mechanical properties, good water absorption performance, and low susceptibility to environmental effects. It is therefore impossible to obtain the adhesion between the two layers that is indispensable for the application. However, EVOH is compatible with PA6, PA66, PA6/66, and with maleic-anhydride-functionalized polyolefins. Molding compositions based on polymers of this type are, however, unsuitable as outer layer material. (Para. 4-5)

4. In order to solve the problem of adhesion of EVOH to PA11, PA12, PA612, PA1012 and PA1212 (Para. 12), Schmitz discloses an adhesive layer comprising (Para. 15-23):

a. from 0 to 80 parts by weight of at least one polyamide selected from the group including PA6, PA66, PA6/66 and mixtures thereof;

b. from 0 to 100 parts by weight of at least one polyamine-polyamide graft copolymer that includes the following monomer units;

i. from 0.5 to 25% by weight, based on the weight of the polyamine-polyamide copolymer, of at least one polyamine having at least 4 nitrogen atoms and having a number-average molar mass M_n of at least 146 g/mol, and

ii. at least one polyamide-forming monomer selected from the group including lactam, ω-aminocarboxylic acid, equimolar combination of diamine and dicarboxylic acid, and mixtures thereof; and

c. from 0 to 80 parts by weight of at least one polyamide selected from the group including PA11, PA12, PA612, PA1012, PA1212 and mixtures thereof;

5. Wherein, in the layer I, a total of the parts by weight of (a), (b) and (c) is 100; wherein within an entirety of (a) and (b), at least 20 parts by weight of the entirety include monomer units selected from the group including caprolactam, combination of hexamethylenediamine/adipic acid, and mixtures thereof; and

6. Wherein within an entirety of (b) and (c), at least 20 parts by weight of said entirety include monomer units selected from the group including ω-aminoundecanoic acid, laurolactam, combination of hexamethylenediamine/1,12-dodecanedioic acid, combination of 1,10-decanediamine/1,12-dodecanedioic acid, combination of 1,12-dodecanediamine/1,12-dodecanedioic acid, and mixtures thereof. (Para. 15-23)

7. Such a multilayer article comprising the adhesive composition and an EVOH barrier layer is recited to be useful as a tubular article selected from the group including fuel pipe, brake-fluid pipe, coolant pipe, hydraulic-fluid pipe, fuel-pump pipe, air-conditioner pipe, and a vapor line or as a container, fuel container, filler pipe, and filler pipe for a tank. (Para. 45-46) The pipe may also be corrugated. (Para. 121) The composite may be produced by multicomponent injection molding, coextrusion or coextrusion blow molding. (Para. 127)

8. Additionally, at least one of the layers of the composite may be rendered electrically conductive in order to dissipate electrostatic charges generated by a moving medium for fuel contact applications. This is preferably the layer directly in contact with the moving medium. (Para. 67)

9. Examples of laminates produced according to the invention are recited to include an article comprising the following layers: PA11, PA12, PA612, PA1012 and or PA1212/ adhesive layer/ EVOH layer. (Configuration 2, Table 1)

10. Schmitz is silent regarding the disposal of a fluoropolymer or polyolefin layer in the interior of the tube recited.

11. Boer teaches the same adhesive composition disclosed by Schmitz for use in multilayer composites for storing flammable liquids, gases or fuel. (Col. 2, line 59-Col. 3, line 6, Col. 9, lines 6-10) Boer further teaches that a typical approach to bonding two different materials had been to produce an adhesion promoter consisting of a mixture of the two materials. (Col. 2, lines 7-9) In the invention of Boer, the adhesive is disclosed for use in bonding layers of polyamide and polyester to one another. It is recited that the polyamide component of the adhesion promoter should be readily compatible with the polyamide of the layer the adhesion promoter is bound to in order to facilitate good adhesion. (Col. 8, lines 26-28) Boer also teaches the addition of a 10-85 parts by weight of a polyester component to the adhesion promoter in order to further increase the adhesion between the adhesion promoter layer and the polyester layer. (Col. 8, lines 20, 38-47) Boer evidences it was known in the art at the time the invention was made that the addition of a polymeric component compatible with or corresponding to

the type of polymer the adhesive composition was intended to be bound to increased adhesion between the adhesion layer and the polymeric layer.

12. Jadamus teaches a multilayer article comprising an outer layer comprising a thermoplastic molding composition and an inner electrically conductive thermoplastic layer that can be used for pipes, hollow bodies (such as fuel tanks), filling ports, brake lines, fuel lines, cooling lines and tanks. (Col. 1, lines 64-67, Col. 2, lines 14-16, Col. 5, lines 31-40) The outer layer of the article is recited to comprise molding compositions including polyamides, polyolefins or polyesters. (Col. 2, lines 20-24) Materials suitable for the inner layer are recited to include polyamides, polyolefins and fluoropolymers. (Col. 2 lines 24-28)

13. Suitable polyamides include PA6, PA66, PA612, PA810, PA1010, PA1012, PA11, PA12 and PA1212. (Col. 2, lines 29-33) Preferred polyolefins include polyethylene; polypropylene; ethylene copolymer with n-butyl acrylate, methyl methacrylate, maleic anhydride, styrene, vinyl alcohol, acrylic acid, or glycidyl methacrylate; isotactic or atactic homopolypropylene. (Col. 3, lines 32-45) Suitable fluoropolymers include ETFE, THV, ECTFE and PVDF. Barrier layers for fuel components comprising PVDF, ETFE, THV, polyolefins, and EVOH may also be present. (Col. 5, lines 1-5)

14. Schmitz, Boer and Jadamus are all directed to multilayer articles comprising polyamide suitable for fuel contact applications. One of ordinary skill would have been motivated to include a fluoropolymer or polyolefin interior layer such as those disclosed by Jadamus in the multilayer article recited by Schmitz in order to increase the fuel

barrier properties of the laminate. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have adhered an additional barrier layer to the EVOH layer in the invention disclosed by Schmitz. This would have produced a laminate comprising the following layers: PA11, PA12, PA612, PA1012 and or PA1212/ adhesive layer/ EVOH layer (ethylene content between 25 to 60 mol%)/ adhesive layer/ fluoropolymer or polyolefin layer.

15. As taught by Boer, one of ordinary skill would have been motivated to include 10-85 parts by weight of the fluoropolymer or polyolefin material in the adhesive composition between the EVOH and fluoropolymer or polyolefin layer in order to increase the adhesion between the two layers. This would have resulted in an adhesive layer as recited above by Schmitz that also included 10-85 parts by weight fluoropolymer or polyolefin. This composition would have been the same as that recited by applicant in claim 1. These obvious modifications to the invention of Schmitz would have produced the same invention as claimed in claims 1-6, 10-12, 14 and 17-20.

16. Regarding claims 7-9: Jadamus specifically discloses the fluoropolymers PVDF, ETFE and THV and the polyolefins polyethylene and isotactic polypropylene as useful barrier materials. Jadamus also discloses maleic anhydride grafted polyolefin which is universally known to be an adhesion modified polymer. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilized a barrier material modified with respect to adhesion in order to increase the adhesion between the fluoropolymer or polyolefin barrier layer and the multilayer article. This would have produced the invention as claimed in claim 9.

17. Regarding claim 13: Applicant's specification discloses that "Corrugated pipes are prior art" in paragraph 60 of the pre-grant publication. Additionally, Schmitz specifically recites that the pipe may also be corrugated.

18. Regarding claim 15: Schmitz specifically recites that pipe include an electrically conductive layer.

19. Regarding claim 16: Schmitz specifically recites multicomponent injection molding, coextrusion or coextrusion blow molding.

(10) Response to Argument

Appellant states on page 6 of the appeal brief that the adhesive compositions recited in Schmitz and Boer differ from the instantly claimed bonding agent layer II in that "neither contains a fluoropolymer or a polyolefin". The examiner does not dispute this point. The appellant goes on to state the teachings of Boer which establish that it was common for those among the level of ordinary skill in the art at the time the invention was made to include 10-85 part by weight of the material that an adhesive layer was intended to be bonded to in order to increase the adhesion between the materials does not cover the embodiment included in the independent claim wherein component c) is not present. This argument is only relevant to a single embodiment of the multitude of embodiments encompassed by claim 1 and is not sufficient to rebut the prima facie case of obviousness set forth for claim 1.

Appellant goes on to state on page 6 of the appeal brief that the prior art does not "disclose or suggest the present bonding agent layer II when component c) is

present, since no adhesive is disclosed that contains fluoropolymer or a polyolefin". However, this assertion ignores the combination of the teachings of Schmitz, Boer and Jadamus. The obviousness rejection set forth in the previous office action properly took into account the full scope and content of the prior art. Schmitz, Boer and Jadamus all discloses laminates comprising polyamide which are useful for fuel transport applications. Schmitz teaches the same adhesive composition claimed by appellant absent component c) utilized in a laminate comprising a polyamide layer, an adhesive layer and a layer of EVOH. Jadamus provides the teaching and motivation to include a polyolefin or fluoropolymer layer in a laminate intended for use in fuel applications. Boer provides the technique by which one of ordinary skill in the art would adhere a fluoropolymer or polyolefin layer to a laminate such as taught by Schmitz. Taken together, the teachings of the prior art obviate the modification of the adhesive composition of Schmitz for use with polyolefin or fluoropolymer instantly claimed.

Appellant has asserted on page 7 of the appeal brief that one of ordinary skill could not have reasonably expected to succeed in adhering the layer I material of Schmitz to a polyolefin or fluoropolymer layer, however, it is the examiner's opinion that the teaching in Boer of the utility of mixing in the material to be bonded in order to achieve adhesion contradicts that assertion. The appellant has also asserted on page 7 of the remarks that they have provided reasoning in order to assert that there is no level of predictability for adhesion of polymeric materials in the art. However, it is the examiner's opinion that the appellant has only presented arguments asserting that the prior art fails to teach the claimed adhesive layer in a single reference, but has not

provided any scientific reasoning or evidence that there is no level of predictability in the polymer arts.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Michele L. Jacobson/

Examiner, Art Unit 1782

/Rena L. Dye/
Supervisory Patent Examiner, Art Unit 1782

Conferees:

/Rena L. Dye/
Supervisory Patent Examiner, Art Unit 1782

/Christopher A. Fiorilla/
Chris Fiorilla
Supervisory Patent Examiner, Art Unit 1700